material, while low temperatures inhibit it. In cold preparations one finds collections of chromatin which stain blue and are called pseudonucleoli. SCHRAUMEN found the same in the cells of shoots of *Vicia Faba* kept at both high and low temperatures. GEORGEVITCH did not find them in warm preparations. In cold preparations the nucleoli show an increase in size, mass, and numbers.—R. CATLIN ROSE.

Fossil Osmundaceae.—KIDSTON and GWYNNE-VAUGHAN[13] have continued their interesting investigations on the fossil Osmundaceae. In the case of the most important of the species which they describe (*Thamnopteris Schlechtendalii* Eichwald) there can apparently be no doubt that they have really to do with the remains of an osmundaceous fern. They find that in this species the center of the stele is marked by the presence of a mass of short tracheids without any admixture of parenchyma, which curiously enough they regard as the equivalent of a pith. It is surely begging the question as to the origin of medullary structures, to regard tissues which admittedly are entirely tracheary and contain not the slightest admixture of parenchymatous cells as equivalent to the medulla of the higher plants. The difficulty of regarding the central mass of short tracheids in *Thamnopteris* as a pith is rendered insuperable, apparently, by the fact that the leaf traces originate from the stele exactly as in those cases where no pith is present, that is without giving rise to any foliar gaps. The views entertained by the present authors and the majority of English writers on anatomy encounter an additional difficulty in that they are quite unable on their hypothesis to explain the presence of internal phloem and internal endodermis in closed steles. These find apparently a very simple and natural elucidation in connection with the reduction theory now advocated by a considerable number of American anatomists.—E. C. JEFFREY.

Bennettitales.—NATHORST[14] has described the more or less complete reproductive apparatus of a number of bennettitean forms. There are three species of *Williamsonia* from the Jurassic beds of Whitby and Scarborough, England. In these were found in different cases both microsporangia with microspores, and seeds. The structure of the microspores is illustrated by admirable photomicrographs. A new genus (*Wielandiella*) has a very remarkable vegetative organization. The stem branches freely in an apparently dichotomous manner and is quite slender. The cones occur in the forkings of the branches. The vegetative structure resembles that of the problematic *Anomozamites*. The cones showed remains of both pollen and seeds. The structure of the microspores of a third genus (*Cycadocephalus Sewardi*) is described. These are remarkable for their close resemblance to fern spores. For comparison, a figure of *Wel-*

[13] KIDSTON, R., and GWYNNE-VAUGHAN, D. T., On the fossil Osmundaceae. III. Trans. Roy. Soc. Edinburgh **46**:1909.

[14] NATHORST, A. G., Paleobotanische Mitteilungen. 8. Handl. Kgl. Svensk. Vetensk.-Akad. **45**: no. 4. 1910.

trichia Fr. Braun from the Mesozoic of Franconia is introduced. The result of the present important communication is to enlarge our knowledge of the male organs of the Bennettitales by seven different species belonging to five different types. Two species of *Williamsonia* have monosporangiate strobili. The same condition is clearly demonstrated in *Cycadocephalus*. The author wisely refuses to commit himself as to the nature of the Bennettitean inflorescence, and avoids any reference to its possible homology with the angiospermous flower. —E. C. JEFFREY.

Rôle of ammonium salts.—PRIANISCHNIKOW,[15] working with grasses, has already shown that a substitution in sand cultures of $\frac{1}{4}$–$\frac{3}{4}$ of the $NaNO_3$ by $(NH_4)_2SO_4$ increases the power of the plant to gain phosphoric acid from raw phosphates (phosphorite), while in absence of $(NH_4)_2SO_4$ the plants show phosphoric acid starvation. Total substitution, however, greatly reduces the harvest. Both these effects are attributed to the released sulfuric acid. In partial substitution the acid was strong enough to aid in dissolving the phosphorite, and in total substitution so strong that it greatly injured the plants. It is also shown that $CaCO_3$ is very effective in preventing injuries by $(NH_4)_2SO_4$, and if only $\frac{1}{4}$–$\frac{1}{2}$ enough was used to neutralize the liberated sulfuric acid, the consumption of the phosphorite was also much favored. In working with barley, peas, and buckwheat, the author has determined that mixtures of $NaNO_3$ and $(NH_4)_2SO_4$ are better sources of nitrogen than either one alone, for, as he states, the first is physiologically basic (base liberated due to the consumption of NO_3 as source of nitrogen) and the second physiologically acid (acid liberated due to the consumption of NH_4 as the source of nitrogen). The two maintain the culture medium neutral. The author does not attempt to decide between the relative values of ammonium salts and nitrates as a source of nitrogen when the former are of very weak acids, as those used by RITTER[16] to settle this question for fungi.—WILLIAM CROCKER.

Fossil conifers.—NATHORST[17] has described with truly admirable clearness and judgment the cones of the problematical coniferous genus *Palissya* from the Rhaetic of Schonen in Sweden. The ovuliferous cone scales are characterized by the presence of two rows of opposite seeds, with very loose integuments or epimatia. The author concludes that the evidence of the organization of the cone scales tends to connect the genus with a second genus described in the article, namely *Stachytaxus*. This genus has yewlike foliage, and attached to the ends of the twigs are lax cones with distant scales, each of which bears two ovules, provided with a widely flaring integument or possibly an epimatium comparable with that found in the Taxineae. The author argues for the taxineous affinities

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[15] PRIANISCHNIKOW, D., Zur physiologischen Characteristik der Ammoniumsalze. Ber. Deutsch. Bot. Gesell. **26**[2]:716–724. 1909.

[16] Ber. Deutsch. Bot. Gesell. **27**:582–588. 1909.

[17] NATHORST, A. G., Paleobotanische Mitteilungen. 7. Handl. Kgl. Svensk. Vetensk.-Akad. **43**: no. 8. 1909.